

EFEKTIVITAS SUMUR RESAPAN AIR HUJAN SEBAGAI UPAYA KONSERVASI AIR TANAH DI SUB-URBAN BANTENG, SLEMAN

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INTISARI

Dusun Banteng merupakan daerah sub-urban Sleman yang berada di zona transisi Cekungan Air Tanah Yogya-Sleman. Dusun Banteng masuk kawasan strategis resapan air, ditandai dengan adanya sumur resapan yang bertujuan untuk konservasi airtanah. Tujuan dari penelitian ini adalah (1) mengetahui terjadinya pengaruh sumur resapan terhadap Tinggi Muka Airtanah (TMA) *seasonal*. (2) Keterkaitan intensitas curah hujan dengan TMA. (3) Mengetahui efektivitas sumur resapan Dusun Banteng dalam meresapkan curah hujan.

Data diperoleh dari pengukuran lapangan dan pengamatan TMA *timeseries* melalui pemasangan logger pada dua sumur pantau. Data primer berupa pengukuran muka airtanah *seasonal* pada musim kemarau, peralihan, dan penghujan. Survei penggunaan lahan untuk nilai koefisien limpasan dengan acuan *U.S Forest Service* kemudian diolah dengan metode rerata tertimbang. Pengukuran nilai permeabilitas tanah dengan metode *invers augerhole*. Penilaian matematis efektivitas sumur resapan menggunakan SNI 02-2453-2002. Teknik analisis data menggunakan statistik inferensial dan analisis deskriptif kuantitatif.

Kedalaman muka airtanah Dusun Banteng efektif untuk sumur resapan yaitu lebih dari 1,5 meter. Fluktuasi kenaikan TMA *seasonal* sumur observasi di area banyak sumur resapan sebesar 3,56 meter sedangkan sekitar area lahan terbuka 4,42 meter. Pola aliran airtanah di tiga musim sama, mengalir dari Utara ke Selatan namun yang membedakan adalah kontur TMA. Hal tersebut menandakan sumur resapan Dusun Banteng tidak berpengaruh terhadap pola aliran dan TMA *seasonal* 42 sumur observasi. Grafik hubungan hidrograf dan hyetograf menggambarkan curah hujan berkorelasi positif terhadap TMA di dua sumur pantau. Terdapat 4 segmen detail, segmen II merupakan *rising limb* TMA yang signifikan mencapai 3,5 – 4 meter selama 56 hari, segmen III menunjukkan hidrograf TMA konstan selama 100 hari, segmen IV fase hidrograf resesi. Sumur pantau Utara lebih responsif menaikkan TMA namun Sumur Pantau Selatan lebih responsif mempertahankan TMA yang sesuai konsep konservasi airtanah. Efektivitas 33 sumur resapan di area jalan Dusun Banteng memiliki nilai 26,1% pada skenario I dan 18,7% pada skenario II. Efisiensi sumur resapan dipengaruhi oleh curah hujan, sedimentasi di sumur resapan dan keadaan *inlet* sumur resapan.

Kata Kunci: Fluktuasi airtanah, hidrograf, hyetograf, sumur resapan, efektivitas.

EFFECTIVENESS OF ARTIFICIAL RECHARGE AS EFFORT GROUNDWATER CONSERVATION IN SUB-URBAN BANTENG, SLEMAN

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ABSTRACT

Banteng is a Sleman sub-urban area, located in transition zone of Yogya-Sleman groundwater basin. Banteng including recharge area which is strategic marked by the presence of artificial recharge well which are intended to groundwater conservation. The research aims to (1) determine the effect of artificial recharge well in the seasonal groundwater level. (2) Find the correlation of rainfall intensity with water table. (3) Determine the effectiveness of artificial recharge well in absorbing rainfall.

The data of this research were obtained from the fieldwork and water table time series observation by loggers in the two monitoring wells. The primary data are measurements of seasonal water table in the dry season, transitional and rainy seasons. Land use survey to identify runoff coefficient value with weighted average method. Measurement permeability value with inverse augerhole. Effectiveness calculation of artificial recharge well using SNI 02-2453-2002. Data analysis with inferential statistics and quantitative descriptive method.

The depth of Banteng groundwater level is effective for artificial recharge well which is more than 1,5 meters. Increasing fluctuations of seasonal water table in the area with many artificial recharge wells is 3,56 meters while the seasonal water table in the open land is 4,42 meters. Groundwater flow in three seasons has a direction from North to South but the contours of water table are different. This indicates that artificial recharge wells have no effect on the flow pattern and seasonal water table in observation wells. Hydrograph and hyetograph illustrates that rainfall is positively correlated to the water table in two monitoring wells. There are 4 detail segments, segment II is a significant rising limb of water table reaching 3,5 - 4 meters for 56 days, segment III shows a constant water table hydrograph for 100 days, segment IV recession hydrograph. North monitoring well are more responsive to increasing water table but the South Monitoring Well is more responsive to maintain the water table which is suitable with the concept of groundwater conservation. The effectiveness of 33 artificial recharge wells in Banteng has a value of 26.1% in scenario I and 18.7% in scenario II. The efficiency of artificial recharge well is influenced by rainfall, sedimentation in artificial recharge well, and condition of inlet.

Keywords: *groundwater fluctuations, hydrographs, hyetographs, artificial recharge well, effectiveness.*